

REVERSIBLY EXPANDABLE ENERGY ABSORBING ASSEMBLY UTILIZING
SHAPE MEMORY FOAMS FOR IMPACT MANAGEMENT AND
METHODS FOR OPERATING THE SAME

ABSTRACT

[0035] A reversible energy absorbing assembly including a shape memory foam disposed within an interior region, wherein the shape memory foam is adapted to expand to an expanded configuration in response to fluid communication with a fluid source. The shape memory foam is a material selected from the group consisting of shape memory alloys and shape memory polymers. Once expanded, the assembly effectively absorbs kinetic energy of an object upon impact with the assembly. The shape memory foam can be thermally activated to restore the original configuration of the energy absorbing assembly. Methods of operating the energy absorbing assembly are also disclosed.